
OE256-07 Duct Mounted E-BUS CO₂ Sensor Technical Guide

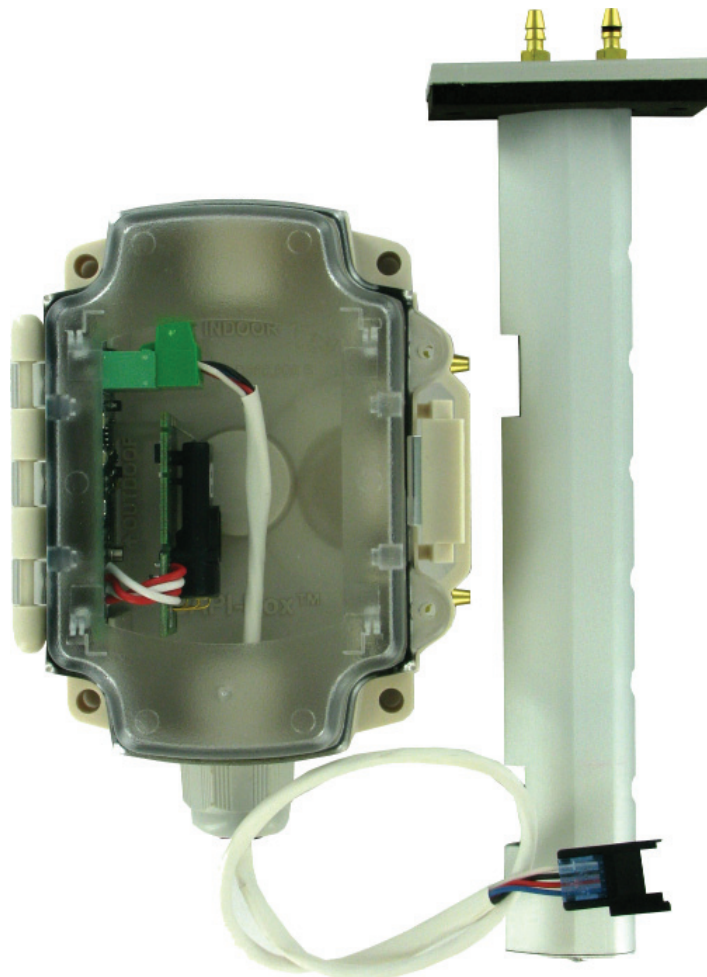


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PART NUMBER CROSS REFERENCE TABLE	
PART DESCRIPTION	PART NUMBER
Duct Mounted E-BUS CO ₂ Sensor with Remote Pickup Tube	OE256-07
Wall Mounted E-BUS CO ₂ Sensor	OE256-05
E-BUS LCD Digital Room Sensor Temp Only	OE217-02
E-BUS LCD Digital Room Sensor Temp & RH	OE217-03
E-BUS Digital Room Sensor Temp & RH	OE217-04
EBC E-BUS Cables - varying lengths	EBC-XXXF
VCB-X Controller	OE335-23-VCBX



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Overview

The OE256-07 Duct Mounted E-BUS CO₂ Sensor with Remote Pickup Tube is used for monitoring duct CO₂ levels and is designed for permanent mounting in the Return Air duct. It utilizes an aspiration box to accurately capture CO₂ levels in the duct. It connects to the VCCX2 or VCB-X Controller by using an E-BUS cable with E-BUS connectors. See **Figure 1** for dimensions.

The Wall Mounted E-BUS CO₂ Sensor (OE256-05) is used for monitoring space CO₂ levels and is designed for permanent wall mounting in the conditioned space. It connects to the VCCX2 or VCB-X Controller using an EBC E-BUS Expansion Cable. It can be daisy-chained with the E-BUS Digital Room Sensor (OE217-02, OE217-03, OE217-04) for applications requiring both a space CO₂ sensor and space temperature sensor. For more information, refer to the *OE256-05 Wall Mounted CO₂ Sensor Technical Guide*.

Some typical applications are:

- Controlling ventilation in a building where the occupancy varies frequently
- Controlling ventilation to ensure excess outdoor air is not causing energy waste
- Ensuring good air distribution throughout building zones

Features

The CO₂ Sensor provides the following:

- Uses the patented dual beam Non-Dispersive Infrared™ (NDIR) technology
- A very accurate and stable sensor guaranteed to maintain its accuracy due to infrared self-calibration feature of sensor
- Sensor accuracy of +/- 50 ppm @ 1000 ppm or 2% of the measured value
- Annual drift of +/- 2 ppm per year
- Measurement range of 0 to 2000 ppm
- HB LED under front cover shows active CO₂ sensing

Environmental Requirements

The Duct Mounted E-BUS CO₂ Sensor needs to be installed in an environment that can maintain a temperature range between 14°F and 122°F and a humidity range between 5% and 95% RH (non-condensing).

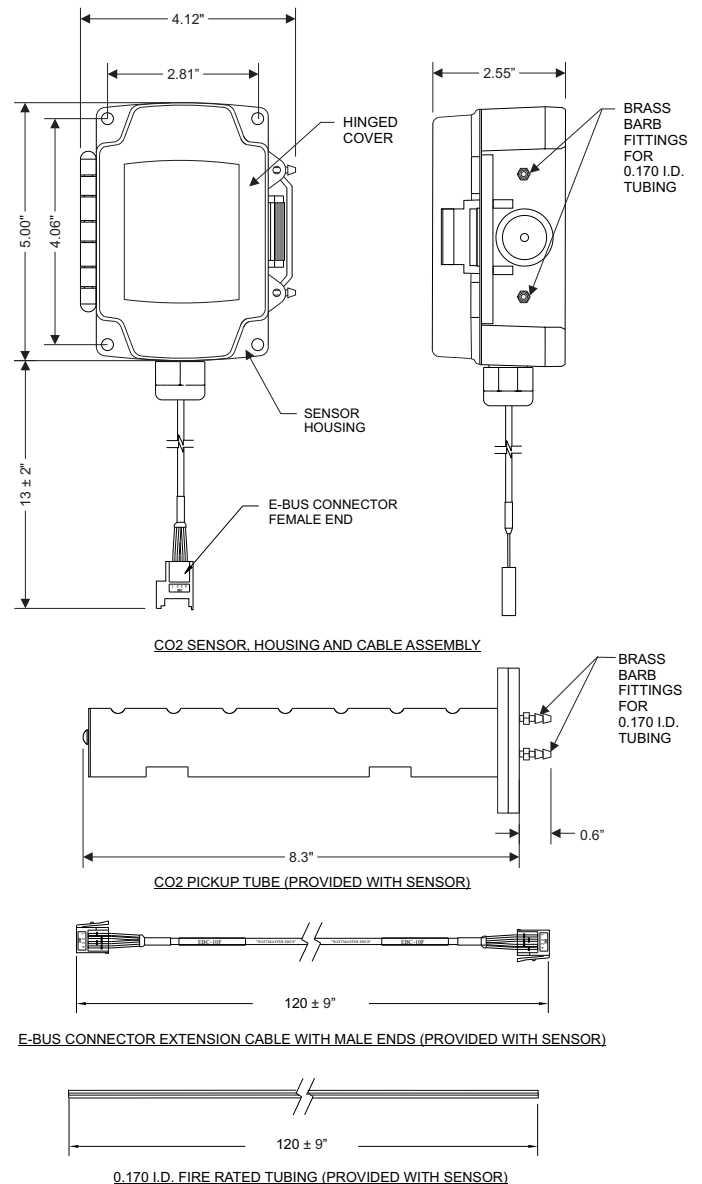


Figure 1: Duct Mounted E-BUS CO₂ Sensor with Remote Pickup Tube Dimensions

Duct Mounted E-BUS CO₂ Sensor Installation

Duct Mounted CO₂ Sensor Installation

To install the Duct Mounted E-BUS CO₂ Sensor, please follow the instructions below. See **Figure 2** for detailed illustrations of the Duct Mounted E-BUS CO₂ Sensor and its components.

STEP 1: Find the general location on the side of the Return Air Duct where you want to mount the CO₂ Sensor. Be sure to locate the box with the airflow in the proper direction per the airflow label. A conduit clamp is provided to help seal the opening where the sensor cabling penetrates the aspiration box housing.

STEP 2: Connect the sensor's attached cable which has a Jack E-BUS connector to the provided EBC E-BUS Cable. Then connect the EBC E-BUS Cable to the Unit Controller or EBC Hub or Adapter Board and then to the Unit Controller.

STEP 3: Secure the sensor in its aspiration box assembly to the ductwork with the (2) supplied sheet metal screws.

STEP 4: Mount the remote pickup tube assembly separately to the ductwork by first cutting a 1¹/₄" diameter hole in the ductwork wall. Then insert the remote pickup tube into the hole. Secure the remote pickup tube to the ductwork by inserting (2) supplied sheet metal screws through the (2) mounting holes in the remote pickup tube mounting plate and securing the remote pickup tube assembly by screwing it to the ductwork using a manual or powered screw driver to tighten the screws.

STEP 5: Using the supplied 10 ft. long tubing, connect the remote pickup tube to the aspiration box assembly, cutting the tubing to fit.

INSTALLATION & WIRING

Duct Mounted E-BUS CO₂ Sensor Installation

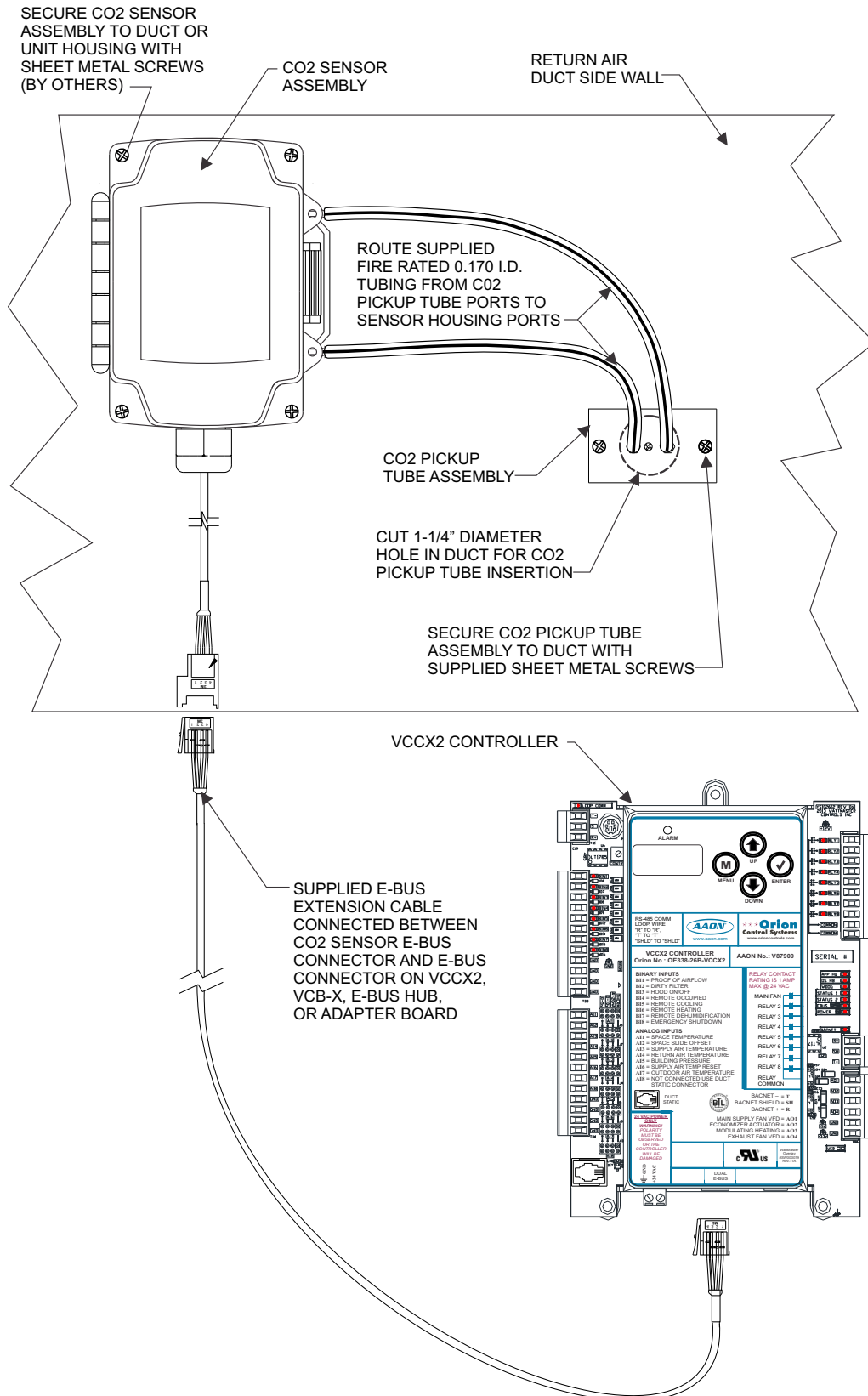


Figure 2: Mounting and Cable Installation for Duct Mounted E-BUS CO₂ Sensor

INSTALLATION & WIRING

Duct Mounted E-BUS CO₂ Sensor Wiring to HVAC Unit

Duct Mounted E-BUS CO₂ Sensor

The OE256-07 Duct Mounted E-BUS CO₂ Sensor with Remote Pickup Tube is used for sensing the current CO₂ level in the HVAC unit's return air stream. This is useful when you want an average CO₂ reading in the area served by the HVAC unit or when you don't want a wall mounted E-BUS CO₂ Sensor due to sensor tampering concerns in the space.

The OE256-07 Duct Mounted Return Air CO₂ Sensor is comprised of the CO₂ Sensor, the WattMaster Aspiration Box Assembly, and a Remote Pickup Tube. See the dimensional and installation information in Figures 2 & 3 for mounting, wiring, and installation details.

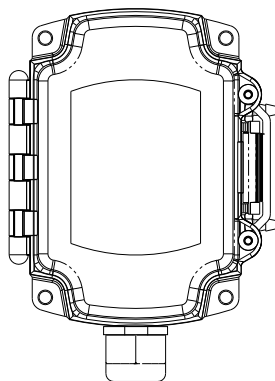
The Duct Mounted Return Air E-BUS CO₂ Sensor with Remote Pickup Tube is designed to be mounted in the return air duct of the HVAC unit and uses its integral aspiration box to sample the CO₂ level in the duct. See Figure 3 below for wiring and installation details.

NOTE: If using multiple E-BUS Sensors or Modules, the E-BUS Hub or Adapter Board may be required.

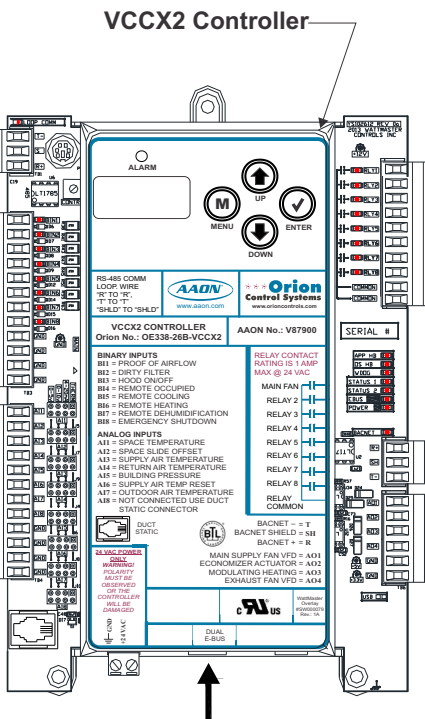
NOTE:

1.) The Duct Mounted E-BUS CO₂ Sensor Connects to the VCCX2 or VCB-X Controller using an EBC E-BUS cable of the required length or the provided 10 foot EBC cable.

OE256-07 Duct Mounted E-BUS CO₂ Sensor



EBC E-BUS Cable with Jack Connection



10 Foot EBC E-BUS Cable (Provided)

Figure 3: Duct Mounted E-BUS CO₂ Sensor & Digital Room Sensor Wiring (VCCX2 Controller Shown)

Using LEDs to Troubleshoot

LEDs are available for troubleshooting the CO₂ Sensor. There are two LEDs that are visible at an angle through the plastic cover. See **Figure 4** for locations.

COMM LED

The COMM LED blinks on whenever communications are sensed.

HB LED

Initially, the HB LED blinks fast for 30 seconds. It will then blink once every 30 seconds. A CO₂ sample is taken once every 30 seconds.

Altitude Correction

Altitude correction can be configured using Prism 2 software installed on a computer. The altitude can be configured at a value of 0-15,000 feet. The default is 500 feet.

TB1 Terminal Block (CO₂ Reading)

The TB1 terminal block should only be used to test the sensor when the sensor cable is plugged into the controller and the sensor and controller are powered up. Directions: Set the meter for DC volts and connect the GND probe to the GND terminal and the + probe to the CO₂ 0-5 terminal. Look at the output voltage and record it. Multiply the voltage times 400. The value should match the CO₂ as read on the System Manager TS, Modular System Manager, Modular Service Tool, or Prism 2. If the signal doesn't match the sensor reading, call AAON Controls for a replacement.

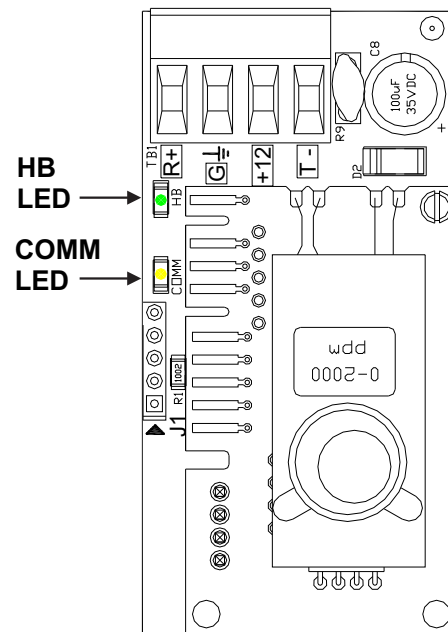


Figure 4: OE256-07 Board LEDs



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